THE AMERICAN JOURNAL

OF

OPHTHALMOLOGY.

VOL. XVIII. FEBRUARY, 1901. No. 2.

ORIGINAL ARTICLES.

THE POSITION OF OPHTHALMOLOGY IN THE CURRICULUM OF THE MODERN MEDICAL SCHOOL, WITH SOME SUGGESTIONS AS TO THE METHOD OF TEACHING IT.

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WITH the rapid advance in the methods of medical teaching the United States made within the last two decades, it is not to be wondered at that as a part of the chaotic condition incident to such expansion there should be considerable difficulty in arranging the curriculum with a just valuation of each and every branch taught.

The lengthening of the course to four terms of from six to seven months or more each has given opportunity for an increase in the amount of work to more than double that required twenty-five years ago or, in some colleges, even ten years ago. Within that time the methods of medical instruction have been almost completely revolutionized and the proper adjustment of the teaching of the different branches—some of them entirely new in that period—has been a source of much perplexity and dif-

ficulty to the committees on curriculum on whom this duty usually falls.

In this paper I propose to consider the claims and requirements of ophthalmology in this division of time and extent of instruction. Ophthalmology is not one of the newer branches, such as bacteriology for instance, and has been taught in some fashion as a distinct subject in some of our medical schools for thirty years or more. This, however, was done usually by a lecturer or clinical professor outside the regular faculty and often limited to the "spring course." No doubt in some instances the very best use was made of the opportunity and the hearer was benefited to the extent of his capacity and the attention he gave to it. In others, however, just enough was given to mystify and confuse the student. As no examination was held and attendance on the lectures was not compulsory, the usual result of such conditions prevailed, and a very vague smattering was all the student carried away with him from the college halls. All this is now changed. Ophthalmology is a part of the required curriculum in every medical college of repute, an examination is held on the subjects taught, and in many the professor is a voting member of the regular faculty.

These responsibilities having been granted and assumed, what and how much of ophthalmology shall be taught to the students who have been placed under our guidance?

Ophthalmology is an immense field, and there would be no difficulty in finding plenty of work for four times the amount of space that can be allowed for its teaching even in our extended terms. There are limits of time and limits of practicability. What we need and desire is that which is essential to the general student as a foundation for future work without burdening him with the superfluous or that which he will not be called upon to use. Horace Greeley once said a newspaper was made more by what it left out than by what it put in, and so with us the process of elimination is the one which presses most imminently for our consideration.

In the discussion of the question we shall have to reckon with another feature which is likely to force itself upon the attention of our curriculum committees in arranging the schedules of instruction, and that is the elective system. Prof. Bowditch of Harvard dwelt at length upon this problem in his

presidential address at the last meeting, in Washington, of the Congress of American Physicians and Surgeons, and it is certain that we shall have to face its solution at no distant day. The field of medical practice has become so broad that young men feel that they must prepare themselves for certain lines of work when they begin their medical studies, and often indeed during their collegiate courses. It would be unjust to require as much ophthalmology of a man who proposes to practice gynæcology as one who intends to do eye work, and *vice versa*. In every properly-ordered curriculum, therefore, the claims of each of these classes—the general and elective—should be fully admitted and dealt with.

The number of hours that shall be given to the study of ophthalmology and the manner in which the lectures shall be arranged must, in some degree, be regulated by the peculiar condition of each college and will be determined by the different requirements of the ordinary and elective student. It is safe to say, however, that from forty-five to fifty hours is the very least that should be demanded for the ordinary student, this including the didactic lectures, demonstrations and clinics.

Ophthalmology is, I believe, usually taught to the fourth class only, and with the present tendency to condense the teaching of the separate branches as much as possible, it seems on the whole a much better system than to divide it between the third and fourth years. The teaching may be distributed throughout the entire fourth year, giving one didactic and one clinical lecture each week for a six-months' or a twenty-four-weeks' course.* Or it may be still further condensed into a single semester, giving two didactic and two clinical lectures each week. If the first semester from October 1st to the holidays is selected, an examination should be held immediately upon the termination of the course, while the subject is still fresh in the student's mind, in order that he may go on to other work unfettered with this. The examination whenever held should be written and require an answer to from six to twelve questions and be conducted under the supervision of the professor. The didactic lectures may be delivered before

*Six full months is, I believe, the minimum length of a course recognized by the Association of American Medical Colleges.

the whole class in the lecture hall; but for demonstrations in the laboratory and for clinical work the class must be divided into sections. Clinical ophthalmology particularly can be taught in no other way. It is impossible that a class of one hundred or fifty or only twenty-five can obtain a satisfactory view of an operation or observe the salient points of a case of disease of the external portion of the eye from the benches of an amphitheatre, or even when standing around an operating table or the chair of the instructor in the clinic. The days are past when the professor can stand in an amphitheatre and harangue five hundred students, some of them a hundred feet distant from him, and consider that he is teaching them clinical ophthalmology. Ophthalmology can be taught properly only at close range, and for this small classes or sections are essential. At the last meeting (1900) of the Association of American Medical Colleges, held at Atlantic City, several instructive papers were read and thoroughly discussed on the best methods of teaching clinical medicine. The opinion was universal that it should be done in small sections of the class, numbering not more than ten and with a decided preference for only five in each section.

This division into sections requires a number of demonstrators or instructors when the class is large. Experience has shown that there should be at least one demonstrator for every ten students, if the time of the student is not to be wasted in aimless standing around. When the student has become somewhat advanced in his studies, cases may be turned over to him for examination and diagnosis, an account of which he will give in detail to the instructor. In a large clinic, with abundant material, a number of demonstrators may be at work at the same time, under the general supervision of the professor, or the different sections may come on separate days.

The teaching of ophthalmology should be, as we have said, didactic, demonstrative and clinical. The tendency of late years to make the teaching of the more practical branches—internal medicine and surgery in all its branches—almost, if not altogether, clinical, is based on an erroneous conception of the natural processes of education. The didactic lecture must ever hold an important position in any system of instruction

which aims at thoroughness and follows the scientific principle of going from the general to the particular or individual.

Students must be taught what they are to look for before they can intelligently search after it, and the relation of all known facts to each other must be understood and formulated before the significance of any one can be fully realized. In other words, a ground work of general principles must be established before a structure of accurate knowledge can be erected.

The work should, therefore, be properly distributed between the lecture hall, the laboratory and the clinic. Didactic lectures and demonstrations in the laboratory should form about one-half the course of instruction.

The anatomy of the eye and its adnexa—a thorough knowledge of which must be held as a fundamental requisite—is in most, if not all, medical colleges taught by the professor of anatomy as a part of the general structure of the human body. This may be done well, or it may be done badly, but in either case it can hardly fulfill the demands of the student of ophthalmology who requires a knowledge of the anatomy of these parts with special reference to their pathology. Moreover, as anatomy is usually taught in the first year, or at farthest in the second year, and ophthalmology in the fourth, what knowledge the student may have acquired from the professor of anatomy of the anatomy of the eye will have been more or less obscured by the mass of other heterogeneous learning he may have acquired in the meantime. It would be well then to relieve the chair of anatomy of the teaching of the anatomy of the eye except in the most general way, and as it is necessary in a consideration of the general structure of the body, and not as a special organ.

This discussion of the anatomy of the eye should begin with a demonstration of the structure of the orbit and especially its relations to the accessory sinuses and the openings leading into the adjacent cavities, with an indication as to their significance in pathological conditions of each.

The orbital contents, and especially the origin and insertion of the external muscles of the eye and their relations to the capsule of Tenon, should follow this. Those students following an eclectic course should be required to make care-

ful dissections of these parts on the cadaver; but for demonstration to the ordinary student, a wet preparation, showing the globe with the muscles attached, and the origin of those starting from around the optic foramen, is very convenient. One such I have used with satisfaction for many years.

The macroscopic anatomy of the globe itself should be taught by dissected specimens. An antero-posterior section of a hardened eyeball will show the relations of the parts very satisfactorily. Those following an eclective course should be required to make dissections of animals' eyes for themselves. If the professor is a good draughtsman, he will make diagrams on the blackboard, more or less extensively, as an assistance in demonstration, or employ drawings already prepared for the purpose, but these should never be allowed to take the place of the actual specimen.

The demonstration of the microscopic anatomy comes next, and should be done by means of actual sections under the microscope. Good photomicrographs of the sections placed by the side of the microscope will serve as excellent guides to the demonstration, supplementing the general features of the specimens drawn on the blackboard, or in the more finished card drawings.

Having finished with the eye as an anatomical organ, the next division of the subject will be its study as an optical instrument. In order to a full understanding of this, a knowledge of the laws of light and the principles of optics is essential. Some of our students have already had courses in physics as a part of their preliminary education, and the number of these is increasing yearly. But many have not had such training, and even those who have, need to have their knowledge of the subject refreshed and arranged for this special application. It is necessary, then, to make up this defect by going over the laws governing the action of light, and in particular those applying to the phenomena of refraction and the formation of images by dioptric apparatus. In making this exposition it is not necessary to go into complicated mathematical formulæ, except, it may be, for the elective student. The method of triginometrical construction as followed in the little book of Mr. C. F. Prentice, on "Ophthalmic Lenses," and by some others is amply sufficent for the general student.

Without a thorough grounding in these laws, a further study of the application of them to the optical condition of the eye is fraught with almost insuperable burdens and mystifications.

Moreover, if the student does not make himself familiar with them now, he never will later, when he has assumed the responsibilities of practice, and this knowledge will smooth the way for any future work he may wish to do in that direction. The object in all education should be, not so much the communicating of isolated or even groups of facts, as the teaching of the best means of learning how to obtain knowledge and arrange it systematically in a scientific method.

Along with this of course goes a general description of the different kinds of lenses, the methods of determining their power, and the modes of designating them in the various inch and the metric systems.

From this the transition is easy to an application of these laws to the human eye as an optical instrument, embracing a thorough demonstration of the schematic or reduced eye, emmetropia, accommodation and its anomalies, and the forms of ametropia and the means of correcting the latter, with the principles underlying them.

This is done by didactic lectures and by demonstrations on the artificial eye and other optical appliances showing the actions of these laws.

Finally comes the study of the eye as an organ of sense. This includes, first, the methods of testing the visual acuteness, with the principles on which they are based, with the various kinds of test-objects and the manner of recording the amount of vision. Theories of color perception can be then gone over briefly, followed by the law of projection, the visual field, binocular vision, diplopia and its significance as to the special muscles involved, and strabismus. In most colleges a greater or less amount of physiological optics is taught by the professor of physiology. What has been said in reference to the teaching of anatomy of the eye by the professor of anatomy is applicable here, and the professor of physiology can be very properly relieved of much of the teaching that has hitherto fallen to his lot.

It will be seen that the foregoing comprehends only such

fundamental facts in regard to the anatomy and physiology of the eye as every student should be possessed of in order that his general medical education shall be passably complete. Moreover they are essential to any proper teaching of clinical ophthalmology.

In the teaching of clinical ophthalmology each professor will be guided largely by the material at his command and the facilities afforded him. As has already been said, this can be done satisfactorily only in small classes or sections of not more than ten, while five are preferable.

The external or commoner diseases demand first attention, because those are the diseases which the young practitioner is most likely to meet with and in the diagnosis of which he is most liable to make regretable mistakes. Particularly should the signs and symptoms of conjunctivitis, iritis, and glaucoma be so clearly pointed out and insisted upon as to make an error in diagnosis impossible. Many an eye would have been saved from destruction if the general practitioner had only had the little knowledge which would not have allowed him to treat for weeks an iritis for a conjunctivitis; and few ophthalmic surgeons have escaped the experience of having sent to them, by a friend, a case of leucoma of the cornea to be operated on for cataract. Such mistakes as these should not be possible in any practitioner turned out of a modern medical college. Special attention should be given to those diseases of the eye due to or attendant upon systemic disease or disease of other organs, such as syphilis, gonorrhœa, rheumatism, etc. When possible, bacteriological preparations of all conjunctival discharges should be exhibited.

The same principle holds good in regard to operations as to diseases. It is of much more importance that the general student should be familiar with the technique of enucleation—an operation he may be called upon at any time to do—than with the manner of extracting a cataract, which he never will or never should do unless he proposes to practice ophthalmic surgery.

As much practical experience should be given in examining the refraction of the eye by means of test-glasses, the shadow test and the ophthalmometer as possible, but not at the expense of a thorough study of the commoner external

inflammatory diseases. A good working knowledge of the ophthalmoscope is very desirable for any general practitioner, but in these days when a specialist is within easy call it is by no means essential. Ophthalmoscopy is not an art easy to learn, and to become proficient in it to the extent of relying upon one's own observation requires much time and no limited experience. It is impossible for the average student with the abundance of work he is compelled to do in the other departments to give the amount of time necessary to get a command over the instrument that shall enable him to bring it with any profit into his practice. An attempt to teach it to the general student is, except in rare cases, a waste of time. It is different, of course, with the elective student, and to him the principles of ophthalmoscopy should be fully taught with as much exercise in its use as possible.

A compulsory examination for permission to practice medicine is now in force in most of the States of the Union and must become at no distant day a law in all. There will follow naturally from this a reciprocity among the licensing boards of the different States based upon a certain standard of requirement. The Association of Examining Boards formed within the last two years will inevitably bring about this result. This will, in its turn, have the effect of bringing the curriculum of our various medical schools into something like uniformity in order to meet the demands made by these examinations.

The object in writing this paper has been to indicate, as the opinion of one teacher and a member of a committee on curriculum, what in his experience and observation of nearly twenty years has been found necessary and possible in adjusting the teaching of ophthalmology to that of the other branches in the time alotted in a full four years' course. By other teachers other schemes may have been found more satisfactory, and it is hoped that an expression of the views of the teachers throughout the country may lead finally to such an approach to uniformity and thoroughness in the teaching of this branch as shall give all that is necessary and none that is superfluous.

CASES FROM THE CLINIC.

By HENRY DICKSON BRUNS, M.D.,
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Spontaneous Dislocation of a Cataract of More Than Twenty Years' Standing into the Anterior Chamber; Apparently the Extra-Capsular Nucleus.—On November 24, 1900, Mr. X., a farmer, spare, wiry and weather-beaten, presented himself at my offiice and gave the following history: His age is 70; his right eye has been blind with cataract for the last twenty-three years, and the pupil looked white instead of black. To his great surprise, a little more than a year ago, he began to see a little with this eye, and he noticed that a part of his pupil, up and inwards, in the shape of a crescent, had become black. Last September his eye began to grow red and painful, and these symptoms became extreme and lasted a long time. Of late this has been much better; the pain and dull ache have almost disappeared.

The right eye presents a moderate ciliary injection, the cornea is clear, and the pupil moderately dilated; the tension is perhaps a trifle elevated. In the anterior chamber, down and outward, with its edge resting on the junction of the cornea and iris, is a roundish, dark-yellow body, about three-sixteenths of an inch in diameter and about one-eighth of an inch thick. The surface is slightly rough and lusterless, and the edge thin and delicately crenated. The upper and inner portion of the pupil is perfectly black and clear, and through it the ophthalmoscope shows the vitreous body to be loaded with opacities. R. E.V.= fingers at one foot only. L. E.V.= $^{20}/_{70}$ but with + 1.5s = $^{20}/_{20}$ fairly well, and with + 4.5s. = Sn No. 1 well at the proper distance.

Now, this can be the shrunken nucleus of a hypermature cataract, which has escaped by the breaking open of the capsule at the same time (probably) as the zonule gave way, or it may be the atrophic remains of both lens and capsule, detached from the center of a very old cataract. To close inspection through a lens, it gave the impression of being devoid of capsule, and presented the exact appearance of

certain small dark-yellow nuclei that we deliver in making extraction. In either case all shreds and remains of capsule and zonule must have been well retracted behind the rather narrow iris, for no sign of them was to be seen in the pupil. As the patient was confident that the mass was decreasing, and as the heaviness and pain were much less and still diminishing, and as an operation on an eye in such condition and with such a history would probably end disastrously and could only be undertaken to relieve pain, I advised giving nature a chance; together with hot bathing and the friction of the forehead at night with a drachm of the mercurial and belladonna ointment. (Ungt. hydg. ℥j., Ext. belladon. ℥j.)

I report this case because the peculiar conditions and appearances are new to me, although I have seen many clear and cataractous lenses in the anterior chamber, and because I can find nothing similar to it in the cyclopedic work of Louis Stricker on the Crystalline Lens System (1899).

Buphthalmus Much Improved by Iridectomy.—V. C., a white ("dago") infant of two months, was brought to the clinic on May 8, 1899, and was assigned to the care of my chief of clinic, Dr. E. A. Robin. The parents stated that the R. E. had been sore for one week.

The general appearance of the child is good. The R.E. is injected, and a diagnosis is made of keratitis interstitialis, R. E.; buphthalmus, O.U.

Mercury bichloride, gr. $^1/_{96}$, once daily is prescribed, and eserine at clinic three times a week. Iridectomy is advised in L. E.

May 25, 1899. The $^1/_{96}$ bichloride is to be given twice daily. The cornea of L. E. is brighter.

June 7, 1899. L. E. a large iridectomy outwards.

July 10, 1899. L. E. much improved. The cornea is decidedly clearer than that of R. E.

July 17, 1899. Conjunctivitis, especially in R. E. Half-a-grain of zinc sulphate in an ounce of water is instilled.

August 30, 1899. Large iridectomy in R. E., without accident.

September 3, 1899. Doing well.

November 18, 1899. Can undoubtedly see with L. E. In R. E. there is sub-acute conjunctivitis, for which a mild ni-

trate of silver solution is applied once a week, and drops containing boracic acid, borax and camphor are ordered for home use.

November 25, 1899. The conjunctivitis is much better.

January 15, 1900. In both eyes the buphthalmus is absolutely stationary. In R. E. the cornea shows the central opacities of the old interstitial keratitis, but that of L. E. is clear and bright, making the eye a very useful one for the future.

RIGHT HEMIANOPSIA — ALEXIA — WITH PARTIAL TEMPORARY VISUAL APHASIA AND AMNESIA, AND AMNESIC COLOR-BLINDNESS FOLLOWING AN ATTACK OF INFLUENZA.*

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MR. D. L. W., aged 55, a merchant, consulted me on November 15, 1898, with a note from his physician, Dr. J. C. Brown, of Vincentown, N. J., regarding a disturbance of vision, the exact nature of which he had a great difficulty in describing. He was a large muscular man who had enjoyed excellent health up to the 10th of September, 1898, at which time, while suffering from what he regarded as an ordinary cold, he had a slight attack of vertigo at his tea-table, and soon after went to bed. He was awakened in the night by a right hemicrania, unattended by nausea or vomiting. The pain persisting, his physician, Dr. Brown, was called the following morning, and found him with elevated temperature and a rapid, full pulse. He was sent to bed, where he very soon became unconscious and remained so for three days. This time remains a perfect blank to him, but his wife related that he vomited almost constantly. He then recovered partial consciousness, with frequent lapses into his preceding condition. During the conscious intervals his hemicrania persisted,

*Read before the Ophthalmic Section of the College of Physicians of Philadelphia.

the pain commencing in the right supra-orbital region and extending backward to the occiput and nape of the neck. The lapses into unconsciousness grew less frequent and persistent, and gradually faded out; but he was confined to his bed for three weeks. There was no general paralysis of motion, and no convulsions at any time, but he thinks that on first recovering his senses he saw double. His statements on this point were confused and uncertain; indeed in his attempt to describe his visual trouble he grew discouraged, and in a helpless way turned to his wife for assistance. Under careful inquiry it became evident, however, that he had had some confusion of vision on recovering his consciousness, for even after leaving his bed, on looking out of the window well-known objects, even the houses on the opposite side of the village street, appeared unfamiliar, and he failed to recognize his passing friends, although he saw them with sufficent clearness to recognize them. When spoken to through the window by acquaintances he would inquire of his wife who they were, evidently suffering from a visual amnesia or mind-blindness, his memory for familiar objects and faces having been completely lost. At the time of his first visit to my office this had disappeared, except for frequent lapses into what he called "bad memory." Careful study, however, revealed the fact that this difficulty existed only for objects or persons when looked at; that he was mind-blind to impressions received through the sense of vision only. His acuity of vision for letters was $^{6}/_{20}$ in each eye, which rose to $^{6}/_{12.5}$ with correcting glasses. The charts for the field of vision revealed absolute right hemianopsia, with a well-marked contraction of the remaining half of the field, both for form and color. In the attempt to take the color fields it was at once discovered that he could not always name the colors correctly, although he could recognize them when named; that is to say, when asked if blue were red, he promptly responded no; but asked if blue, he responded yes, and so on with the other colors. He found no difficulty in matching correctly the Holmgren skeins. The amnesic color-blindnes, in a word, was almost complete. He could call the letters on the test card correctly, with some hesitation, but was entirely unable to read his newspaper or make out a bill of fare at a restaurant, but curiously enough

could add up a column of figures. He could read a short sentence by spelling each word slowly, naming the letters aloud, and could then go back and read the sentence, to use his own expression, "could get the sense of it." But without this method the printed page conveyed no meaning to him.

He conversed freely, could write not only his own name without difficulty, but could write a business letter, he said, as well as ever, but found great difficulty in reading it after it was written. His wife, a very intelligent woman, related that he had markedly improved in many respects; that not only could he usually recognize his friends, but that he was slowly regaining his normal characteristics; that during the early days of his convalescence he would sit mute for hours and did not wish to be disturbed, and was much averse to conversation, which was apparently due to his difficulty in framing a reply. Her own expression for the condition was that his "brain did not seem to work right," although he understood anything that was said to him. The ophthalmoscopic appearances were those of a retrograde neuritis. That this was a correct interpretation of the ophthalmoscopic picture presented for each eye seems demonstrated by the beneficial results of the treatment. There was no disturbance of ocular motility; the hemicrania and occipital pain continued, and he slept badly. He was placed on ascending doses of potas. iodide. In a month the pain had disappeared; he slept better; vision had risen to $^{6}/_{7.5}$, and the hemianopsia for form had partially disappeared, but still remained for red. There was marked concentric narrowing of the form field, still relatively greater for the hemianopic side, and under fatigue this threatened to increase. Indeed, on taking his field a second time while fatigued from the examination, it shrank back into the hemianopic field for form also. He had resumed his business, that of a dealer in general merchandise, but found that if his store were crowded with customers he became confused, his pain in the occipital region returned, and he was compelled to seek quiet.

On January 19, 1899, V.=$^{6}/_{5}$, miscalling the confusion letters. His wife reported him more talkative and like himself. He could bear the confusion of business better; could make out his railroad time-table with some difficulty, but was

unable to read a book or his newspaper without first spelling out each word.

On March 27, 1899, he could with some difficulty read his paper and conduct his business without trouble. The field of vision was nearly normal for form, but the hemianopic color fields persisted. He was not seen again until February 21, 1900, when he came with a return of the alexia and of his hemianopsia for both form and color, apparently due to great depression of health and spirit over the hopeless illness of an only son with Bright's disease.

At the present writing, February 1, 1901, Mr. W. has improved in his general conditions; has less occipital pain, memory is better, and visual disturbance is less annoying, but he readily lapses into the former conditions from fatigue or under any worry or annoyance in his place of business. He has obviously aged very rapidly during the past year. His hair, which was simply mixed with gray in January, 1900, is now white. The hemianopsia continues, but there is no additional contraction of the remaining field.

QUININE AMAUROSIS; ITS FREQUENCY AND REMOTE MANIFESTATIONS.

By H. MOULTON, B.S., M.D.,
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IN discussing "A Case of Quinine Amaurosis" in the January number of this JOURNAL, Dr. Alt remarks that he has "thought it not impossible that of the many cases of atrophy of the optic nerve which are observed here some might be due to the former habit of many people of eating quinine to prevent chills and fever." The probable correctness of this remark is sustained by the more recent pathological investigations of Holden[1] and de Schweinitz,[2] and by my own clinical observations. The degeneration of the retinal elements begins in a few hours after the sight is affected in experimental quinine blindness; consequently in every case some permanent impairment of function (contracted field) must remain.

[1] "Toxic Amblyopia," 1896.

[2] Arch. of Ophthal., Vol. XXVII., p. 583.

The rarity of observations of quinine amaurosis in view of the vast multitude of people who, in this section of the country particularly, take large doses of the drug, is frequently discussed. I have been enabled to report a single observation;[3] but in conversation with physicians I have heard of quite a number of persons who have been blind temporarily after large doses of quinine. As most cases of severe malarial intoxication requiring large doses of quinine occur in sections remote from large towns, and as recovery of normal central vision occurs spontaneously in nearly every case by the time the patient is up and around, it is obvious why many cases should occur and never appear in literature or even be observed by ophthalmologists. Nevertheless it remains true that an idiosyncrasy is necessary to determine the effect of quinine on sight and that only a very few have this idiosyncrasy—not enough to deter a physician from prescribing the drug in all cases as freely as he deems necessary.

The observations which I have made, and which bear out the remark of Dr. Alt, are two in number.

The first was in a negro child of 8 years, with vision of $^{20}/_{40}$ when corrected. She had contracted fields, small retinal vessels, and pale optic nerve-heads. Her mother said that when 4 years old the child had taken some very heavy doses of quinine for a fever and was blind for a few days following, but soon recovered about the same degree of vision she now has. The child was in good health and free from discoverable hereditary taint. The parents were of the better class of negroes and the history I think can be relied upon.

The second observation was in Miss T., a refined young lady of 19 years and a perfect picture of health, who consulted me for an error of refraction. At the age of 4 years she had measles. During this sickness or shortly after Dr. B., of Brinkly, Ark., gave her one ounce of quinine sulphate in less than a week. During the time she was taking the quinine she lost her sight and was practically blind for many weeks without visible inflammation of the eyes. At the end of five months useful vision had been recovered and has remained without material change until now. It is of interest to add that the mother of the young lady thought that the blindness

[3] Ophthalmic Record, August, 1899.

was due to belladonna. It was only after being questioned that she told of the quinine. She was positive as to the amount of the drug and time of blindness, and she is a woman whose statements of facts can be relied upon. The possibility of the quinine affecting the eyes in such a way had not been suggested to her. My record of the case was made fifteen years after the blindness occurred. Central vision was good. With a mydriatic

R. E., $^{15}/_{20}$ with + .25 D. s. ⌒ + 12.5 D. c. ax. 45° = $^{15}/_{15}$.

L. E., $^{15}/_{30}$ with + .25 D. s. ⌒ + .50 D. c. ax. 75° = $^{15}/_{15}$.

Fields for form: R. E. concentrically contracted, nasally to 30°, above to 20°, temporarily to 40°, and below to 25°, from point of fixation.

L. E. nasally to 40°, above to 25°, temporally only to 80°, below to 30°.

The ophthalmoscope revealed white discs with all details distinct and the retinal vessels contracted to less than half their normal size. No other fundus lesions were present.

Knies, in "The Eye in General Diseases," and Story, in Norris and Oliver's "System of Diseases of the Eye," discuss the rare recorded cases of defective sight following measles. All of those cases, however, except one are definitely ascribed to optic neuritis accompanying cerebral or meningeal inflammation or to lesions of the occipital lobe. The exception was a case observed by Carreras y Arago, of "extreme amblyopia with contracted retinal arteries." In my case there was no history or evidence of any intracranial complication and no suggestion in the appearance of the fundus of a former neuritis. It seems just to ascribe the case to the quinine, first because of the dose, second because of the perfect accord with the well-known facts of quinine amaurosis.

These two cases might well have been classed as simple optic atrophy of obscure origin had not the histories been closely inquired into. I believe the remote effects of quinine on the retina and optic nerve exist more often than they are recognized. With good central vision the contracted field to which he has become accustomed is not complained of by the patient and the narrow vessels and white discs are not seen unless accidentally discovered by the ophthalmologist in his routine daily work.

The same idea is borne out by the case of the three-year-old child formerly reported, which I had the privilege of seeing two years after my first observation. The same appearances remained that were noted at first. The white discoloration of the optic discs was just as intense and the arteries and veins were just as narrow. Useful vision had returned, but in the last year had not seemed to improve much.

OPTICO-CILIARY RESECTION IN CASES OF ABSOLUTE GLAUCOMA.*

By DR. FAGE,

AMIENS, FRANCE.

Translated by Adolf Alt, M.D., St. Louis, Mo.

IT is well known that the classic operations, like iridectomy, sclerotomy, etc., are dangerous or of no value in eyes which have reached the absolute stage of glaucoma. If an acute attack should occur, the only remedy left would be enucleation.

From this consideration, optico-ciliary resection should be employed more frequently, for it is a means which, while conserving the shape and volume of the eyeball, allows of a diminution of the hardness of the eye, and stops the irritative phenomena and the pains. Of course, this concerns only such eyes as are definitely deprived of all vision; furthermore, this intervention cannot but render the enucleation more easy of execution, if this should later on become necessary.

It is well known that this operation was first devised by Rondeau (1866), and employed later by Boucheron (1876), who demonstrated how easy of performance it is, and what its advantages are.

In a few words, this is the procedure: The conjunctiva and Tenon's capsule are cut at the point where the Rectus internus is inserted. Then this muscle is lifted up with a strabismus hook, a thread is passed through it to prevent its retraction, and then its tendon is cut just at its scleral insertion. Then the eyeball is turned temporally, and with a pair

*Archives d'Ophtalmologie, December, 1900.

of scissors, curved on the flat, the optic nerve, the ciliary nerves and the ciliary blood-vessels are cut. Warlomont and de Wecker have constructed compressing scissors for this operation, in order to stop the hæmorrhage.

As soon as the nerve has been severed, the eyeball is turned temporally as far as possible, so as to expose its posterior pole to view, and to enable the operator to remove the part of the nerve remaining attached to the eyeball. Then the eyeball is replaced into its normal position, and after the hæmorrhage has been stopped by slight compression, the rectus internus is stitched to the sclerotic at its normal insertion. Then a compressive bandage is applied.

Some operators have proposed to cut the optic nerve by means of a button-hole opening in the conjunctiva and Tenon's capsule, without severing any of the Rectus muscles. According to our opinion, this procedure increases the difficulty of the operation instead of simplifying it; besides, it allows only of the simple section of the nerve, which offers fewer chances of success than does the resection.

With a little practice the operation, as we have described it, is easily made. In some individuals the anæsthesia produced by the subconjunctival injection of cocaine has been all that was required.

What we have to be afraid of most is an intraorbital hæmorrhage. This may become profuse enough to cause a strong exophthalmus, produce troubles in the nutrition, and facilitate ulceration of the cornea. In one case this has forced me to enucleate an eye three days after the neurectomy, and some operators have had to do this at once. Usually, this hæmorrhage is moderate and stops on compression, and the eyeball returns entirely into its position in the orbit.

When there is no important exophthalmus, an ulceration of the cornea is hardly to be dreaded. According to Boucheron, this may be explained by the fact that there are superficial ciliary nerves which insure the nutrition of this membrane.

We have been in a position to observe three of our cases long enough to draw some conclusions. In one case, in a woman, 57 years of age, an irritative chronic glaucoma had become absolute. In the other two cases we had to deal with

eyes afflicted with adherent leucoma, with absence of anterior chamber, considerable increase of intraocular tension, and even severe pains in one of the cases, who had previously been advised to have the eye enucleated.

After the optico-ciliary resection the irritation disappears, the pains cease, and, what is very important, the tension is sensibly reduced. Such eyes which were previously stretched, staphylomatous or buphthalmic, show a tendency to become smaller.

When we think that an eyeball which has once arrived at the period of absolute glaucoma contains in its irido-corneal angle such conditions for retention that, even when enucleated, it will remain hard for at least several hours, it is difficult at first to admit that the optico-ciliary neurectomy can have any influence upon the intraocular tension.

Yet it is well to remember, that the peri-choroidal space is in communication with the intervaginal space of the optic nerve by means of fissures, the termini of which are undoubtedly obstructed at the level of an excavated and sclerosed papilla optica. The cutting of the optic nerve may reopen these routes of excretion, and this fact, as insignificant as it may be, is a factor which we cannot neglect.

Moreover, the cutting of the ciliary nerves diminishes the secretion of the aqueous humor. This fact has been established experimentally by Nicati. That the hypertonus lasts only a few hours in the enucleated glaucomatous eyeball, is due to the fact that the secretion of aqueous humor becomes less as soon as the action of the ciliary nerves is interrupted.

From all this, the optico-ciliary resection answers to two indications, to which every antiglaucomatous procedure must correspond:

1. It moderates or lessens the secretion of the aqueous humor through the section of the ciliary nerves.

2. It favors the filtration by means of the papillary channels by widely opening the sheaths of the optic nerve.

Undoubtedly the successes are not absolutely constant. We have above mentioned the most frequent complications, intraorbital hæmorrhage, great exophthalmus, ulceration of the cornea; yet we have also shown how, with a little operative ability, these can generally be avoided.

We have also noted a recurrence of the pain, and even a post-operative papillitis of the fellow-eye. This is explained by the regeneration of the ciliary nerves, the possibility of which Bietti has demonstrated. This is a fact which must force us to renounce an optico-ciliary resection whenever we can suspect a sympathetic ophthalmia.

But when this complication is not to be feared, and this is generally the case with glaucomatous eyes, the optico-ciliary section or better the resection is an excellent operation, and deserves in future to be more frequently resorted to.

PAMPHLETS RECEIVED.

"A Case of Sinus Thrombosis," by A. R. Baker, M.D.

"Corneal Corpuscular Activity," by J. E. Willetts, M.D.

"On the Clearing Up of Corneal Scars," by Prof. E. Fuchs, M.D.

"On a Case of Otitic Cerebral Abscess," by Prof. G. Gradenico, M.D.

"Detachment of the Choroid after Cataract Extraction," by Prof. E. Fuchs, M.D.

"Medical and Surgical Experiences in the South African War," by G. S. Ryerson, M.D.

"Clinical Study of the Ocular Symptoms Found in So-Called Posterior Spinal Sclerosis," by Ch. A. Oliver, M.D.

"The Influence of Abducting and Adducting Prisms on the Estimating of Distance," by J. A. Lippincott, M.D.

"A Clinical and Histologic Study of a Case of Melanotic Sarcoma of the Choroid, Presenting Symptoms of Secondary Glaucoma," by Ch. A. Oliver, M.D.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. A. SHOEMAKER, M.D.
ST. LOUIS, MO.

COMPARATIVE VALUE OF ENUCLEATION AND THE OPERATIONS WHICH HAVE BEEN SUBSTITUTED FOR IT.

G. E. de Schweinitz, in a paper read before the Thirteenth International Congress at Paris, reaches the following conclusions:

1. Eyes so diseased or injured that they already excited sympathetic ophthalmitis, or eyes which contain malignant growths, should be enucleated.

2. Eyes in which a suppurative process has begun may be enucleated with safety, provided the process has not involved the surrounding orbital tissues or already begun to extend posteriorly so that it would be difficult to obtain an aseptic socket; otherwise evisceration is the safer operation.

3. The eyes so wounded that they are likely to excite sympathetic ophthalmitis should be enucleated, if two weeks or more have elapsed since the reception of the injury, because under these circumstances enucleation affords a greater security to the patient than any of its substitutes. If the eye is so injured that the sclera is extensively lacerated, enucleation is also indicated.

4. Eyes so wounded that they are likely to excite sympathetic ophthalmitis, if seen before two weeks have elapsed, need not be enucleated—that is, evisceration or Mules's operation may be performed, because, with perhaps the exception of a single case, there is no positive proof that these operations have of themselves excited sympathetic disease. They may fail to arrest the development of sympathetic ophthalmitis, just as enucleation may meet with a similar failure.

5. Staphylomatous eyeballs, especially when they occur in children, need not, in fact should not, be enucleated. When uninflamed, they may be treated by the operation of abscission or complete keratectomy primarily with safety, but it cannot be promised that subsequently, it may be years after-

wards, the stump will not undergo calcarious or osseous change which may excite sympathetic irritation in the other eye and require enucleation. Staphylomatous eyes are suited to Mules's operation.

6. Eyes which are greatly shrunken (excessive phthisis bulbi) should be enucleated, as they do not lend themselves with safety either to evisceration or to Mules's operation.

7. Painful blind glaucomatous eyeballs, or eyeballs blind from chronic non-traumatic iridocyclitis, may be treated by evisceration, with or without the insertion of an artificial vitreous, in the place of enucleation, with safety. They furnish one of the few indications for opticociliary neurotomy, or neurectomy if enucleation or one of its substitutes should be refused by the patient.

8. Enucleation is preferable in very old patients, when the time element is important and when physical condition is such that the prolongation of convalescence is undesirable.

9. Evisceration as a substitute for enucleation is a safe operation, and temporarily yields a stump which is better than the stump after ordinary simple enucleation. Subsequent shrinkage of this stump, however, ultimately renders the cosmetic effect of the operation no better than ordinary enucleation, while its inconveniences are much greater.

10. The best cosmetic results among the substitutes for enucleations, if successful abscissions are excluded, are secured by Mules's operation, which is only positively contraindicated by malignant disease, sympathetic ophthalmitis, extensive laceration of the sclera, and extreme phthisis bulbi. But it should be remembered that the primary excellent cosmetic effect of Mules's operation slowly lessens, owing to atrophy of the tissue of the orbit and sinking in of the artificial globe. This diminution in the volume of the stump is, however, much less marked than after simple evisceration.

11. Whenever a complete enucleation is performed, there is no objection to the implantation of a glass ball or of a piece of sponge into Tenon's capsule, except perhaps after enucleation for sympathetic and malignant disease, but it is doubtful if the ultimate cosmetic advantage of the operation exceeds that of a carefully performed enucleation.

12. There is no perfect substitute for enucleation, and

necessarily this operation must continue to be performed in many, if not in the majority of cases. When it is performed according to the rules of improved technique, which include suture of the severed tendons to the conjunctiva, the cosmetic effect of the operation is, primarily at least, as good as any of the substitutes, with the exception of Mules's operation and abscission, and is free from the objections which surround them. It seems likely that with further improvement in technique, and particularly in the manufacture of artificial eyes, the cosmetic effect will be enhanced and render less objectionable the operation of enucleation and less necessary the substitutes for it.

13. An enucleation which pays no attention to the preservation of the relationship between the conjunctiva, ocular tendons, and capsule of Tenon, is a brutal operation which should not be performed unless the disease of the globe and surrounding orbit is of such a character as to render this precaution impossible.

The foregoing conclusions seem to be warranted by the statistical information gathered in this paper, although I fully realize that some of them will not be acceptable to all of the 117 surgeons who have contributed their experience. For example, a number of operators undoubtedly would reject conclusions 2 and 4, although they are in accord with the surgical beliefs of others. So, too, the final sentence in conclusion 5 is in direct discord with some of the recorded opinions, but in equally direct accord with the views of others. In other words, in these conclusions I have endeavored to epitomize the opinions which have been expressed by the various surgeons, although necessarily it was impossible to construct a series of deductions which would be equally acceptable to all contributors. Personally, they seem to me to represent a safe line of practice. In those cases in which complete enucleation is not demanded—and in my opinion they are in the minority—Mules's operation, when successful, certainly furnishes admirable results, but I feel sure that although at the present time, from the cosmetic standpoint, it seems to be one of the best, if not the best, of the substitutes for enucleation, it is not likely to endure as an operative measure in ophthalmic surgery unless the percentage of failure is greatly reduced. I

believe, as I have stated in conclusion 12, that improvement in the technique of performing the operation of enucleation and in the manufacture of artificial eyes will probably be so great in the future that this and other substitutes for enucleation will seldom be required.

ON A NEW METHOD IN THE DISCISSION OF SOFT CATARACTS.

Percy Dunn (*Lancet*, December 29, 1900) believes that the rapid absorption of soft lens matter from the anterior chamber can only occur after the *reduction of intraocular tension* by the removal of the aqueous humor. In order to accomplish this and to overcome some of the disadvantages of the present methods of discission, the author proceeds as follows: The pupil having been well dilated with atropine and the patient anæsthetized with chloroform, a broad cataract needle is passed through the cornea and a vertical and horizontal incision made in the lens capsule. The lens matter having been broken up and the needle partially withdrawn, the latter is turned on its axis, thereby allowing the aqueous humor to escape slowly. On the fourth day but a small quantity of the lens matter remains in the anterior chamber, and but a trace on the fourteenth day. He believes that iritis will not follow this operation as a result of mechanical irritation, but only when antiseptic procedures have been improperly followed.

The author believes that after the aqueous humor is once properly evacuated, the swollen lens would allow only enough to be resecreted to restore the normal tension.

OCULAR MANIFESTATIONS OF DIABETES MELLITUS.

L. A. W. Alleman (*Journal of the American Medical Association*, January 26, 1901) calls attention to the fact that ocular manifestations occur with sufficient frequency in systemic affections to be of great value in diagnosis. While the conditions of the fundus in the advance stages of general diseases have received careful attention and study, the earlier conditions, on the other hand, also require careful scrutiny and investigation. Ocular complications may exist in all forms of diabetes, but are generally found in chronic cases.

The patients generally present themselves for supposed refractive errors. The author refers to a few cases on record in which hypermetropia was caused by diabetes and which fluctuated in amount with the variations of the quantity of sugar in the urine. According to Landolt this is due to a change in the index of refraction of the vitreous. Paralysis of the extraocular muscles are supposed to be due to a peripheral neuritis or to nuclear or peripheral hæmorrhages. Paralysis or paresis of accommodation is a frequent early symptom. The author believes that cataract occurring in diabetes in cases past middle life is due to a general disturbance of nutrition and arterial degeneration; in the young, on the other hand, there is some direct relation between the eye and the general disturbance. He argues with Hirschberg, that there is a distinct diabetic retinitis, characterized either by a degenerative or hæmorrhagic type.

Retinal hæmorrhages, with or without other changes in the retina, accompanied or unaccompanied with conjunctival hæmorrhages, are always suggestive of diabetes. Symptoms of toxic amblyopia frequently occur in diabetes, without a history of excessive indulgence in tobacco or alcohol. Plastic iritis is also encountered in diabetes; keratitis, which is notably an exponent of nutrition disturbances, occurs in this disease. Atrophy of the optic nerve and amblyopia without any assignable cause are occasionally encountered.

EXPERIMENTS WITH EYE MAGNETS.

I. Türk (*Berliner Klinische Wochenschrift*, Oct. 8, 1900) believes that there are two methods for extracting splinters from the eye. The methods, however, are not to be differentiated by the size of the magnet that is employed (respectively the large magnet by Haab and the small magnet by Hirschberg) or the relative number of experiments, but by the operative procedure that is employed. He believes that the small magnet, which in the majority of cases must necessarily be introduced into the vitreous and cause injury to various tissues of the eye, is inferior to the large magnet which, even upon external application, generally exerts sufficient force to withdraw the splinter out of the wound it origin-

ally produced, or to conduct it to the anterior portion of the eye so that a simple corneal section will be sufficient to render its extraction easy. Formerly the indications for the employment of either one of the magnets has been upon former clinical experiments. The author, however, has made a series of experiments regarding the attractive power of the two magnets upon splinters of a given weight and at given distances. In the cases of the large magnets the current employed was from 1 to 13 ampères, and in the small magnet from $3^1/_2$ to $4^1/_2$ ampères. The result of the author's experiments are as follows: The small magnet is preferable when it can be approached within a few millimeters of the splinter without injury to the vitreous. This includes those foreign bodies in the anterior chamber, posterior chamber, iris or lens which can easily be reached by a corneal section. In more deeply situated foreign bodies, where the small magnet can only avail after penetrating the vitreous, the application of the large magnet is indicated. The stronger magnet when properly applied is not only the more effective, but also the least dangerous.—*Philadelphia Medical Journal.*

A CLINICAL STUDY OF ONE HUNDRED AND FIFTY CASES OF HYPERPHORIA.

Wendell Reber, in a paper read before the Section of Ophthalmology at the fifty-first annual meeting of the American Medical Association, June 5-8, 1900, draws the following conclusions:

1. Hyperphoria occurs in about one out of six patients who seek counsel of the ophthalmologist.

2. It is present to the extent of .5 degree or more in one out of three refraction cases.

3. It becomes worthy of special attention in about one out of five refraction cases.

4. It is more likely to be latent before the 30th year—33 per cent. of all cases—and manifest after that time.

5. It occurs most frequently to the extent of about one degree.

6. The most frequent symptoms are supraorbital, temporal, and occipital neuralgias, photophobia, drowsiness, and abnormal physical tire after prolonged near work.

7. A full quota of sleep, daily open-air exercise, and a well-regulated life are all highly important factors in trying to make hyperphorics comfortable.

8. Hyperphoria is found a little oftener associated with esophoria—57 per cent.—than with exophoria—37 per cent. This is probably because compound hyperopic astigmatism with its associated convergence-excess outnumbers all other anomalies of refraction.

9. Convergence-training—if convergence be insufficient—and convergence-repression—if convergence be excessive—frequently relieve hyperphoric symptoms entirely.

10. *The vertical prism has a field of pronounced usefulness.*

11. Prism corrections will be of service in about 50 per cent. of all cases. One-half to two-thirds of the hyperphoria may be corrected for infinity and two-thirds to the full amount for work at the occupation distance.

12. When all these means have been exhausted, section of some one of the vertical muscles may be thought of. About one out of twenty hyperphorics whose deviation is two degrees or more will profit more by tenotomy than by any other treatment. Two or three degrees is likely to be the amount permanently obtained by vertical tenotomy.

13. The only fruit that can be borne of the attempt at hospital or dispensary treatment of hyperphoria—or for that matter any but the simplest muscular anomalies—is vanity and vexation of spirit.

In concluding the author stated that he always does a *complete* tenotomy without fear of an over-correction. That we know very little about the physiology of the ocular muscles; that there are six pairs of muscles; that no one is concerned alone in any movement of the eyes, and that according to Volkman there are something near two hundred possible combinations of these movements, we will perhaps realize how empirical our knowledge is.

THE RADICAL TREATMENT OF LACRYMAL DISEASES.

Walter B. Lancaster (*Boston Medical and Surgical Journal*, January 10, 1901) thinks the great majority of cases of epiphora are amenable to the usual conservative treatment,

which consists of astringents and antiseptic collyria, syringing and probing, and proper treatment of the nasal cavities. In spite of a judicial selection and skillful application of these methods, there remain a considerable number of cases which are not relieved. These are the cases for which something more radical must be done, and any method that promises quick and sure relief is worthy of attention. Such a method it is claimed is to be found in *extirpation of the lacrymal sac and gland.* In the case of a woman with an absolutely impermeable nasal duct and a lacrymal sac distended to the size of a small lemon by the long duration of the disease, the sac filled with muco-pus, the patient was willing to undergo any operation necessary to gain quick relief. The lacrymal sac was removed and the disease was cured. Removal of the sac takes away the source of irritation, and not only does away with the disease of the sac and its dangers, but diminishes the flow of tears materially. The removal of the larger lacrymal gland causes surprisingly little diminution in the apparent moisture of the conjunctival sac. It is only when the eye is exposed to some irritation that the difference is usually apparent, and then the diminution is slight. There is never an absolute dryness. There are some cases in which removal of the gland without the removal of the sac seems to promise relief, and if so is to be preferred. The dangers of the operation are: disfigurement, orbital abscess, injury to the optic nerve and the cornea, and ptosis. The possibility of excessive dryness is conceivable perhaps, but has never occurred so far as the author is aware. The history of five cases is given.

SUCCESSFUL REMOVAL OF CATARACTS IN INSANE SUBJECTS, WITH RECOVERY OF MIND ATTENDING THE RESTORATION OF SIGHT.

William C. Posey (*University Medical Magazine*, December, 1900) reports two cases in which removal of a cataract in chronic insanity produced a rapid and complete cure of the mental disease. In both cases there seemed to be from the history a direct relation between the mental disease and the failure of vision. This may account for the result.

TUBERCULOSIS OF THE EYE; ITS DIFFERENTIAL DIAGNOSIS, PATHOLOGY AND TREATMENT.

Charles Stedman Bull (*Medical Record*, December 8, 1900) regards tuberculosis of the eye as rare as its diagnosis is difficult, as in many cases the bacilli and the giant-cells are the only determining factors. Tuberculous ulcers of the conjunctiva and lids usually occur through the infection of some abrasion, and when they do, the lymphatic glands around the ear are also involved. When the process is primary, the prognosis is favorable. The sclera and cornea are often invaded and show great resistance. The invasion of the nerve-tract is usually secondary. The iris and ciliary body are sometimes invaded by the disease in the primary form and usually results in phthisis bulbi. When the retina or optic nerve is involved it is usually an extension from the meninges. No cases of primary tuberculosis of the orbit have ever been reported.

ESTIMATION OF THE AMOUNT OF INJURY TO THE EARNING CAPACITY OF THE INDIVIDUAL FROM PARTIAL OR COMPLETE LOSS OF VISION.

Howard F. Hansell (*Annals of Ophthalmology*, October, 1900) draws the following conclusions: Blindness is that degree of loss of vision that incapacitates one from earning his living in any occupation requiring the use of the sense of sight, the degree varying according to the demands of the occupation. Vision of less than one-half diminishes the earning power, and the less the vision the greater the loss of the earning power. Monocular blindness is not incompatible with full earning capacity. The loss of earning power owing to defective vision may be computed according to a simple system based upon the ratio of the loss of vision to the full earning capacity at any age and in most occupations.

MISCELLANY.

At the meeting of the Section of Ophthalmology, College of Physicians and Surgeons, held on January 15, 1901, Dr. S. D. Risley gave the clinical history of a case of "Inflammatory Glaucoma Presenting Uniform Features" in a woman, aged 71 years, of gouty diathesis. The attack followed a group of cases of acute conjunctivitis in the family, and was mistaken and treated by physician for that disease for ten days, at the end of which time T. = + 3, vision reduced to fingers at one foot, and field narrowed almost to fixation point. She was detained in the office and repeated instillations of eserine solution made, under which the pain subsided and vision rose to counting fingers at one meter. Before being dismissed she complained of pain in the right eye and dim sight. On examination the anterior perforating vessels were found dilated, anterior chamber shallow, T. = + 2, and pulsation in the retinal arteries which had before been absent, V. = $^1/_{10}$. Under eserine and salicylates, T. normal in both eyes next morning, and in O. D. V. = $^6/_6$, with normal field, and in O. S. = $^6/_{10}$, with temporal field contracted to fixation point and elsewhere to 10°. Following attack of indigestion, symptoms returned in O. S. and iridectomy was performed. Two weeks later she suffered an onset of glaucoma in O. D., notwithstanding that eserine had been instilled regularly during residence in hospital. Iridectomy resulted in great improvement in sight in twenty-four hours, but dimness supervened in forty-eight hours from extensive hæmorrhage which spread over anterior and posterior surfaces of lens. Dr. Risley said that but for the accident of having witnessed the attack of acute transient glaucoma in the right eye prior to the operation upon the left, this case would have furnished an illustration of the tradition that iridectomy upon a glaucomatous eye was likely to precipitate an attack of the disease in the previously healthy fellow-eye.

Discussion.—Dr. de Schweinitz referred to an analogous instance occurring in a woman, aged 65, on whom he had per-

formed iridectomy on the right eye for inflammatory glaucoma. From his experience he believed that where acute inflammatory glaucoma attacked one eye, the other eye was almost certain sooner or later to be similarly affected, and he strongly advised that an iridectomy be performed on the good eye before an outbreak of the disease had complicated the operation and damaged the eye, especially if at any time, either before or after the iridectomy on the opposite eye, the apparently sound eye had exhibited any of the prodromal signs of glaucoma. In reply to a question by Dr. Harlan, he said that he knew there were cases in which the disease had not shown itself in the good eye even many years after the primary attack in the other eye, but nevertheless he considered that an iridectomy not only relieved the patient of the constant anxiety, but gave the most certain hope of checking the disease. He had been informed by Dr. Borsch, formerly on de Wecker's staff, that that surgeon performed an anterior sclerotomy upon the healthy eye at the time the iridectomy was made upon the glaucomatous ball. In cases of iridectomy in glaucoma, de Wecker preferred at first making a sclerotomy and several weeks later the iridectomy.

Dr. Risley said that he was quite in accord with Dr. de Schweinitz regarding the advisability of iridectomy on the fellow-eye as a prophylactic measure, since in a vast majority of cases the second eye was also sooner or later attacked by the disease. Iridectomy, he thought, would remove a source of anxiety from both patient and surgeon. During an acute glaucoma the shallow anterior chamber made successful peripheral iridectomy a very difficult operation, and the profuse bleeding from the cut iris often made it necessary to close the eye with the anterior chamber filled with blood, which he believed often led to partial capsular opacity and prolonged convalescence; whereas, in a healthy eye, the operation was comparatively an easy one and fraught with much less danger from complications.

Dr. Zentmayer referred to a case of subacute glaucoma in a patient, 68 years of age, where, twenty-four hours after an iridectomy, the sight of the fellow eye, the optic nerve of which presented a doubtful pathological excavation, rapidly failed, declining from $^5/_6$ to L. P., with T. + 2.